



*WFD Fresh Water Pearl Mussel (Margaritifera) Risk Assessment Methodology*

**GUIDANCE ON THE METHODOLOGY TO BE APPLIED IN IRELAND'S RIVER BASIN DISTRICTS**

*Paper by the Working Group on Characterisation and Risk Assessment*

Surface water guidance document

This is a guidance paper on the application of a proposed **Margaritifera** methodology. It documents the principles to be adopted by River Basin Districts and authorities responsible for implementing the Water Framework Directive in Ireland. This is a working draft describing a method that will evolve as it is trialled, and will be amended accordingly.

**REVISION CONTROL TABLE**

<b>Status</b>	<b>Approved by National Technical Coordination Group</b>	<b>WFD Requirement</b>	<b>Relevant EU Reporting sheets</b>	<b>Date</b>
Final	March 2005	Impacts and Pressures	None	February 2005

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## **Acronyms**

Habitats Directive (92/43/EEC)	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
IUCN	International Union for Conservation of Nature and Natural Resources
NHA	Natural Heritage Areas
NPWS	National Parks and Wildlife Service (Department of Environment, Heritage and Local Government)
SAC	Special Area of Conservation

## 1. Introduction

The fresh water pearl mussel, *Margaritifera* sp., is a bivalve mollusc belonging to the family Unionidae. In Ireland, *Margaritifera* is a scheduled species under the 1976 Wildlife Act (Statutory Instrument No. 112, 1990) and consequently is statutorily protected. *Margaritifera* is also listed in the Habitats Directive and, as such, Member States are required to establish the necessary conservation measures corresponding to the ecological requirements of the species and its habitat. *Margaritifera* is, in general, a soft-water species in Ireland. The River Nore hosts one of the few known hard water pearl mussel populations. *Margaritifera margaritifera* is listed on the most recent International Union for Conservation of Nature and Natural Resources (IUCN) Red Data List as "Endangered" (IUCN, 1996). *Margaritifera durrovensis* is listed as "critically endangered".

*Margaritifera*'s reproductive strategy involves the annual production by individual females of up to 28 million parasitic larvae called glochidia that attach themselves to the soft gill tissues of trout and salmon during late summer. Several months later, and further upstream, the glochidia drop off the host fish and settle into the stream substrate as juvenile mussels. *Margaritifera* is extremely sensitive to pollution and NPWS data suggests that Q5 is necessary to support healthy, sustainable populations. Eutrophication and siltation pressures are considered the main threats to the conservation status of the species' populations in Irish rivers. The juvenile stages (from 0 to 5 years) are the most sensitive.



**Figure 2.1:** *Margaritifera* specimen



**Figure 2.2:** *Margaritifera* with siphons open.

(Photographs: John Lucey, EPA)

## 2. Aims and Scope

As 'good status' for the Water Framework Directive using Q-values is Q4, this risk assessment **aims** to address the National Parks and Wildlife Service's concern that *Margaritifera*'s specific requirements are included in the Article 5 Characterisation Impacts and Pressures analysis. This **scope** of assessment includes river water bodies.

### 3. Datasets

The NPWS supplied the River Basin District projects with a dataset containing SAC names and the name of the pearl mussel rivers for which the SAC is designated. For each population, the most downstream point or locality was indicated by a grid reference. (Ref: *Margaritifera* SAC Data for RBDs\_v3\_14-02-05.xls) An extract from this dataset indicating the SACs that contain freshwater pearl mussel rivers is included in Appendix I. (Due to the sensitivity of exact population locality information, the spreadsheet has not been included in its entirety)

Information provided to RBDs indicated the current state of knowledge of the conservation status of the populations identified. Given that *Margaritifera* is a long-lived species, a population was considered to be unfavourable if it is failing to recruit, as well as if the population is declining. Based on available survey and monitoring data the NPWS had assigned these rivers 1a, 1b and 2a risk categories according to the scheme in table 3.1 below. The majority of the rivers identified fell into the 1b and 2a categories, as further information is required.

**Table 3.1** Risk Classes applied by NPWB to *Margaritifera* SAC rivers.

1a	unfavourable conservation status
1b	unfavourable conservation status
2a	favourable conservation status or no data available regarding conservation status
2b	no 2b risk categories have been assigned due to limited available data on recruitment rates and population profiles, and also due to the extreme sensitivity of the Freshwater Pearl Mussel to siltation and eutrophication

Updates: exact data on the distribution and conservation status of the species within Irish rivers is currently limited. The NPWS will monitor pearl mussel rivers on an ongoing basis and update the dataset as necessary for inclusion in the review cycle.

### 4. Methodology

Risk classes indicated in the NPWS dataset was applied by RBDs as follows:

- Information provided on the conservation status of the populations identified was treated as impact data, and was considered alongside the Q-Value impact assessment already conducted by RBDs.
- In consultation with national experts, the NPWS agreed that it be assumed that the mussel is present throughout the river system upstream of the end point grid references given (and not simply in the water body upstream).
- The *Margaritifera* impact class was therefore, applied to all water bodies upstream of the point indicated. Identifying water bodies upstream required some judgement:
  - Where a point was located at the upstream end of a long water body, judgement was used to include water bodies upstream of the point itself, and not upstream of the

entire length of the long water body. It was ensured that all tributaries and main channel water bodies flowing to the point were assigned the appropriate *Margaritifera* Risk class.

- Higher risk class always overrode a lower risk class: where two points had been identified and assigned different risk classes within the same catchment, higher risk class from a downstream point overrode a lower class of an upper point.
- Water bodies downstream of a point were not assigned any *Margaritifera* impact risk class.
- For each water body, the *Margaritifera* risk class was compared to the Q-Value risk class. Of the two, the worst case of risk was applied and entered as the pollution risk class for that water body, and those upstream. (For example, where Q= 1a and *Margaritifera*= 1a, a 1a risk class was assigned. Where Q= 2b and *Margaritifera*= 1a, a 1a risk class was assigned. Where Q= 1a and *Margaritifera*= 2a, a 1a risk class was assigned. )
- For water bodies without a Q-impact risk class and only a *Margaritifera* risk class, the *Margaritifera* class was applied.

## **5. Data presentation**

Due to the sensitivity of *Margaritifera* distribution data, RBD projects were instructed to delete or conceal the *Margaritifera* column in the GIS attribute table, or exported formats prior to releasing for public information on RBD websites or publications.

## Appendix I

### Special Areas of Conservation containing Freshwater Pearl Mussel Rivers

Site Code	SAC Name
002171	BANDON RIVER
002170	BLACKWATER RIVER (CORK/WATERFORD)
002173	BLACKWATER RIVER (KERRY)
002047	CLOGHERNAGORE BOG AND GLENVEAGH NATIONAL PARK
000140	FAWNBOY BOG/LOUGH NACUNG
001879	GLANMORE BOG
000365	KILLARNEY NATIONAL PARK, MACGILLYCUDDY'S REEKS AND CARAGH RIVER CATCHMENT
002176	LEANNAN RIVER
000297	LOUGH CORRIB
000163	LOUGH ESKE AND ARDNAMONA WOOD
002165	LOWER RIVER SHANNON
002137	LOWER RIVER SUIR
000375	MOUNT BRANDON
001932	MWEELREA/SHEEFFRY/ERRIFF COMPLEX
002144	NEWPORT RIVER
002162	RIVER BARROW AND RIVER NORE
000781	SLANEY RIVER VALLEY
002031	THE TWELVE BENS/GARRAUN COMPLEX
000197	WEST OF ARDARA/MAAS ROAD